
Information-seeking behavior in complementary and alternative medicine (CAM): an online survey of faculty at a health sciences campus*

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Background: The amount of reliable information available for complementary and alternative medicine (CAM) is limited, and few authoritative resources are available.

Objective: The objective is to investigate the information-seeking behavior of health professionals seeking CAM information.

Methods: Data were gathered using a Web-based questionnaire made available to health sciences faculty affiliated with the University of California, San Francisco.

Results: The areas of greatest interest were herbal medicine (67%), relaxation exercises (53%), and acupuncture (52%). About half the respondents perceived their CAM searches as being only partially successful. Eighty-two percent rated MEDLINE as a useful resource, 46% personal contacts with colleagues, 46% the Web, 40% journals, and 20% textbooks. Books and databases most frequently cited as useful had information about herbs. The largest group of respondents was in internal medicine (26%), though 15% identified their specialties as psychiatry, psychology, behavioral medicine, or addiction medicine. There was no correlation between specialty and patterns of information-seeking behavior. Sixty-six percent expressed an interest in learning more about CAM resources.

Conclusions: Health professionals are frequently unable to locate the CAM information they need, and the majority have little knowledge of existing CAM resources, relying instead on MEDLINE. Medical librarians need to educate health professionals in the identification and use of authoritative CAM resources.

INTRODUCTION

The National Center for Complementary and Alternative Medicine (NCCAM) defines complementary and alternative medicine (CAM) as "a broad range of healing philosophies (schools of thought), approaches, and therapies that mainstream Western (conventional) medicine does not commonly use, accept, study, un-

derstand, or make available" [1]. CAM covers a wide range of therapies and practices popularly referred to as simply "alternative" or "complementary" medicine. It includes acupuncture, herbal medicine, homeopathy, traditional Chinese medicine (TCM), and a host of other practices.

Over the past decade, use of CAM therapies by the American public has increased dramatically. This use was brought to the attention of many health professionals in the 1990s by surveys carried out by David Eisenberg's group at the Center for Alternative Medicine Research and Education, Beth Israel Deaconess

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Medical Center [2, 3]. These studies indicated that as many as four out of ten Americans used alternative medicine therapies, with the total number of visits to alternative medicine practitioners exceeding visits to all U.S. primary care physicians [4]. Other surveys have since confirmed the continued widespread use of CAM therapies in the United States and in other industrialized Western nations [5]. Most significantly, in a recent paper, Kaptchuk and Eisenberg suggested that the United States is witnessing a major paradigm shift in the structure of contemporary health care, where the current dominant biomedical-based system is being replaced by "medical pluralism," in which people use therapies and practices from a variety of healing systems [6].

For both information specialists and health care professionals, finding reliable information for even the more widely known areas of CAM can be a daunting task. First of all, efficacy and safety data based on standard clinical trials are significantly lacking, so often little published information exists in the mainstream biomedical literature. Second, bibliometric studies have shown that much CAM information is scattered in a large number of journals, published in many languages [7]. Furthermore, important information can often only be found in the difficult-to-find "gray literature," such as trade journals, pamphlets, conference proceedings, and market research reports [8]. Federally funded institutions such as NCCAM and the National Library of Medicine (NLM) have tried to remedy this by developing tools that facilitate access to CAM information in the journal literature: such as CAM on PubMed, a subset of PubMed. However, core biomedical bibliographic databases such as MEDLINE still do not index many journals relevant to CAM practitioners, and currently only about fifty Medical Subject Headings (MESH) pertain to CAM. This paucity of information resources is reflected in the 2001 Brandon/Hill list of books and journals, which names only seven textbooks and one journal for the whole area of CAM [9].

A few studies have investigated physicians' experience with and interest in CAM therapies [10, 11]. In a 1998 paper, Curry and Smith considered CAM information from a library's collection management perspective, interviewing physicians, medical students, and librarians to ascertain opinions on the desirability of adding CAM resources to a library's collection [12]. Kleijnen and Knipschild compared standard online biomedical databases such as MEDLINE and EMBASESM for information on vitamins, herbs, and homeopathy [13]. A study by Stone et al. compared eight databases for information on "natural products" used as drugs and found that the European-based EMBASE database contained the greatest number of relevant citations [14]. These authors also searched the Web for CAM information and noted the great variability in the quality of Web-based CAM material [15]. However, there were no published studies on the information needs and information-seeking behavior of health professionals seeking CAM information.

This paper reports the findings of a Web-based sur-

vey designed to study the information-seeking behavior of health professionals seeking CAM information. Our objective was to attempt a preliminary delineation of the relevant literature while identifying educational opportunities for librarians in CAM on the University of California, San Francisco (UCSF), campus.

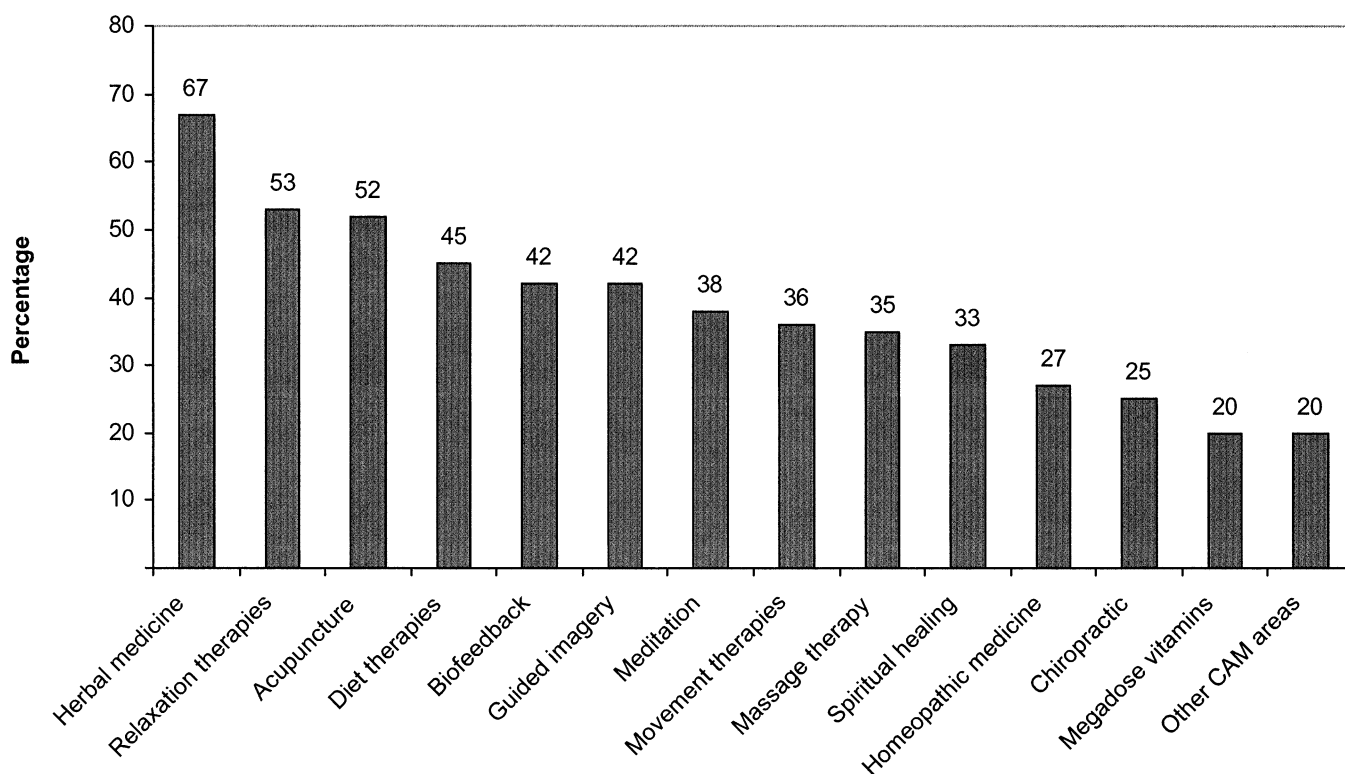
SETTING/SUBJECTS

UCSF is one of nine campuses in the University of California (UC) system, but the only one dedicated solely to graduate and professional study in the health sciences. It includes four professional schools, in dentistry, medicine, nursing, and pharmacy; a graduate division for predoctoral and postdoctoral scientists; the UCSF Medical Center; and the Langley Porter Psychiatric Institute. UCSF encompasses several sites in San Francisco, including UCSF Mount Zion Hospital, and maintains partnerships with two affiliated institutions: San Francisco General Hospital (SFGH) Medical Center and the Veterans Affairs Medical Center (VAMC). It also operates many clinics in the San Francisco Bay Area that specialize in particular health problems or are targeted to specific groups. UCSF employs an estimated 5,800 faculty and research staff, including an extensive network of affiliated health professionals, committed to research, patient care, education, and outreach. In 1998, UCSF received a \$10 million gift from the Bernard Osher Foundation to establish the Osher Center for Integrative Medicine (OCIM), with a mission to search for the most effective treatments by combining CAM and mainstream Western approaches to health care. As part of its mission to educate UCSF health professionals in CAM, the center provided financial support for this project.

METHODOLOGY

The survey instrument was a brief questionnaire, with thirteen simple questions and write-in sections for individuals to provide additional information if necessary (Appendix). Individual questions were formulated with assistance from affiliated faculty at the OCIM. Before being distributed, the survey was reviewed and approved by the university's Committee on Human Research (CHR). Individuals were given the option of completing a Web-based questionnaire or returning a paper copy provided as a Microsoft® Word document email attachment. The sample population was a group of 295 UCSF-affiliated faculty, comprising both clinicians and researchers, who had previously self-identified as interested in CAM. These self-identified individuals had responded to a survey originally sent out to UCSF faculty in 1998 by staff at the UCSF OCIM and designed to identify individuals who were interested in, or were currently using, CAM protocols and therapies. They identified their status as assistant, associate, adjunct, or clinical professor (58%); postdoctoral or postgraduate researcher (8%); and resident (6%). Only email addresses were obtained from the

Figure 1
Complementary and alternative medicine (CAM) areas of interest (N = 121)



Note on percentage values: respondents can indicate interest in more than one area of CAM.

OCIM, so individuals who completed the survey remained anonymous.

The first mailing—consisting of an email message with an introductory message from UCSF librarians, the uniform resource locator (URL) of the Web-based questionnaire, and the Word attachment file—was sent out from the UCSF library in a batch mailing in late September 1999. A reminder mailing was sent out in February 2000. The response to the first two mailings was considered low. After consultations with faculty at the OCIM, a third mailing was sent out in June 2000, this time originating from the OCIM instead of from the library. This mailing resulted in a much higher response rate, bringing the total number of returned surveys to 121.

Results were analyzed using SPSS® 10 for Windows. Basic univariate statistics, such as frequency tables and means, were used to describe the data, and the chi-square test was used to determine correlations between specialties and area of interest in CAM, types of resources consulted, and other patterns of information-seeking behavior. Statistical results though were not significant due to small sample sizes.

RESULTS

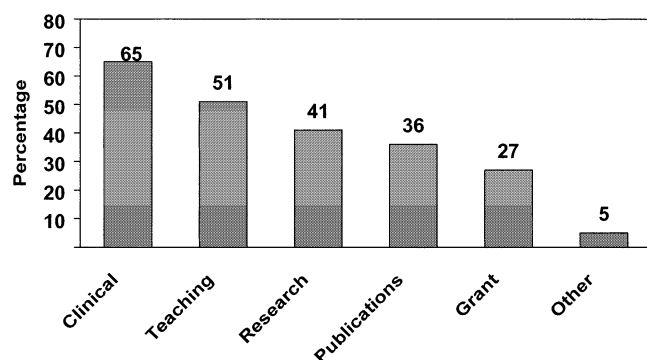
The survey yielded a total of 121 responses, 114 online and 7 paper-based questionnaires, giving a total re-

sponse rate of 41%. Although the authors obtained approximately 500 email addresses from the OCIM (i.e., UCSF faculty expressing an interest in CAM), by the time our survey was first mailed out in September 1999, many of these email addresses had become obsolete, so that the final number of distributed surveys came to 295.

Figure 1 shows the main CAM areas of interest to UCSF health sciences faculty. Of the thirteen types of CAM therapies listed on the survey, the area of greatest interest was herbal medicine (67%). However, more than half (53%) expressed interest in relaxation exercises (encompassing a variety of techniques used to control tension and enhance relaxation), as well as acupuncture (52%). Furthermore, more than 40% reported an interest in dietary regimens such as the Ornish diet (45%), biofeedback (42%), and guided imagery (42%). Other major areas selected were meditation (38%), movement therapies (36%), massage (35%), and spiritual healing (33%). Homeopathic medicine (27%) and chiropractic (25%) were selected by about a quarter of respondents. It is important to note that respondents could express interest in more than one CAM modality (Appendix).

A variety of more esoteric areas of CAM were cited as being of interest by a small number of respondents (mentioned by just one or two individuals). These were: anthroposophical medicine ("Rudolf Steiner"),

Figure 2
Use of CAM Information (N = 121)



Note on percentage values: respondents can indicate more than one application.

Ayurvedic medicine, bioenergetics (including electrodermal screening and applied kinesiology), cognitive and behavioral medicine, dietary supplements (including proteins, hormones, amino acids, glucosamine, DHEA, and creatine), functional foods, energy healing, indigenous healing, Native American medicine, Curandismo (a Mexican and Mexican-American system of healing), and Hmong traditional medicine (a southeast Asian group with a large population in Northern California).

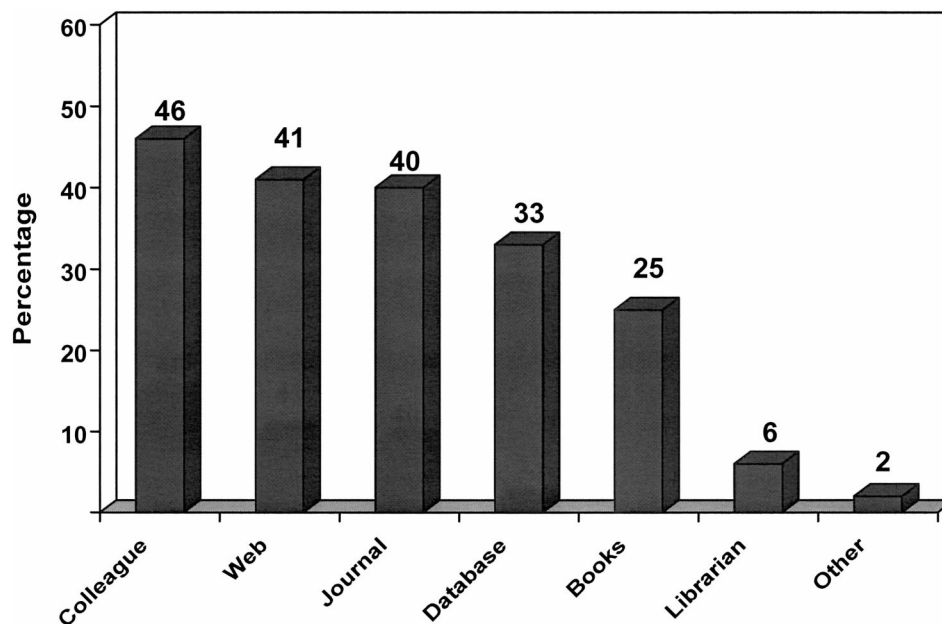
As shown in Figure 2, when asked whether CAM information was sought for clinical, research, or edu-

cational use, more than half (65%) indicated the information was for use in a clinical setting. Fifty-one percent used it in teaching, 41% for research, 36% for preparing publications, and 27% for preparing grant proposals. A small number (3 respondents) indicated use of CAM information for personal health and wellness. (Note that these percentages do not add up to 100%, because respondents could choose more than one option: thus some individuals might use CAM information not only for clinical decision making but also in teaching and research.)

Eighty-one percent reported that they had sought CAM information within the last year, and about 53% said they did so at least once a month. Though not statistically significant because of the small sample size, it was interesting that individuals in clinical pharmacy searched for information more frequently than others, doing so on a weekly basis. Similarly, respondents identifying their specialty as family practice, nursing, and social science or anthropology were the next most frequent searchers, having looked for CAM information at least once a month during the past year.

As a preliminary step in identifying any perceived barriers to finding CAM information, survey respondents were asked "The last time you looked for CAM information: (1) Approximately how much time did you spend; and (2) Did you find the information you were looking for?" Over half (54%) did not respond to the first part of this question, but the average length of time spent looking for information by those who did was thirty minutes. Of particular importance though were replies to the second part of the ques-

Figure 3
Sources of CAM Information (N = 121)



Note on percentages: respondents can indicate more than one source.

Table 1
Journals rated as being "very useful" or "somewhat useful"

Journal	Ranking
<i>Journal of the American Medical Association (JAMA)</i>	12.0%*
<i>Alternative Therapies in Health and Medicine</i>	4.2%
<i>New England Journal of Medicine (NEJM)</i>	4.0%
<i>Archives of Internal Medicine (AIM)</i>	3.0%
<i>British Medical Journal (BMJ)</i>	3.0%
<i>Health Psychology</i>	3.0%
<i>HerbalGram</i>	3.0%
<i>Journal of Alternative and Complementary Medicine</i>	3.0%
<i>Phytotherapy: International Journal of Phytotherapy and Phytopharmacology</i>	3.0%
<i>Psychosomatic Medicine</i>	3.0%
<i>Brain, Behavior and Immunity</i>	2.0%
<i>Journal of Sports Medicine and Physical Fitness</i>	2.0%
<i>International Journal of Sports Nutrition</i>	2.0%
<i>Journal of Psychosomatic Research</i>	2.0%
<i>The Lancet</i>	2.0%
<i>Medical Anthropology Quarterly</i>	2.0%
<i>Planta Medica</i>	2.0%
<i>Psychoneuroendocrinology</i>	2.0%
<i>Western Journal of Medicine</i>	2.0%
<i>Alternative Therapies in Women's Health</i>	1.0%
<i>American Journal of Clinical Nutrition</i>	1.0%
<i>American Journal of Epidemiology</i>	1.0%
<i>Archives of Psychiatry</i>	1.0%
<i>Arzneimittel-Forschung</i>	1.0%
<i>International Journal of Behavioral Medicine</i>	1.0%
<i>Journal of Health Psychology</i>	1.0%
<i>Journal of Clinical Endocrinology & Metabolism</i>	1.0%
<i>Journal of Transpersonal Psychology</i>	1.0%
<i>Medical Anthropology Quarterly</i>	1.0%
<i>Psychological Medicine</i>	1.0%
<i>Social Science & Medicine</i>	1.0%
<i>Stress</i>	1.0%

* Percentage of times cited by respondents.

tions, where 51% considered their last search to have been only partially successful.

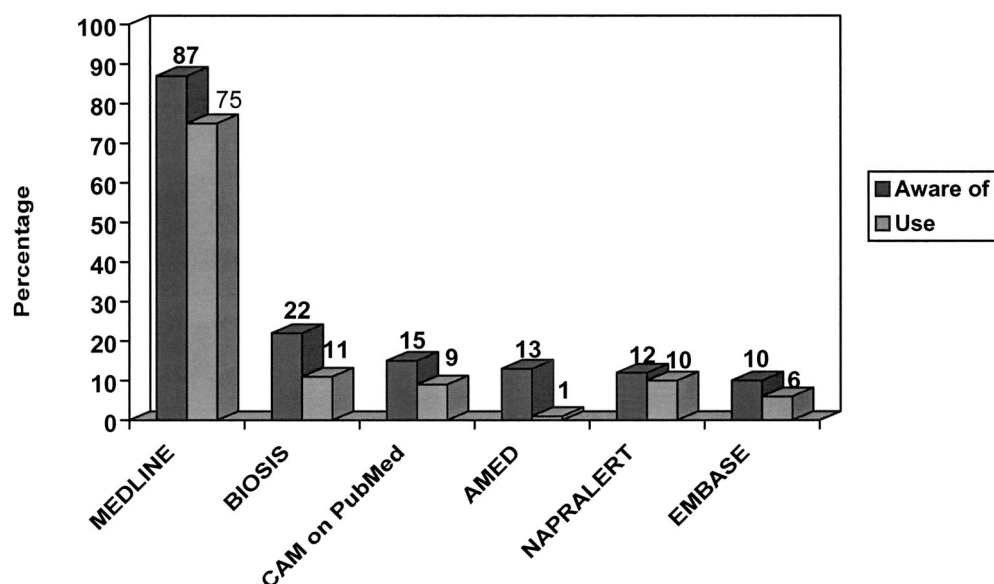
For question five, respondents were asked to rank the usefulness of sources they used to find CAM information (Figure 3). (Note that respondents could select more than one source.) Forty-six percent said they considered their colleagues as "somewhat" or "very useful" sources of CAM information and 41% the Web. Journals were rated "somewhat" or "very useful" by 40%, and almost half of respondents wrote in the name of at least one journal they had consulted within the past year. Specific journal titles rated as being "very useful" or "somewhat useful" are listed in Table 1. One newsletter, *Alternative Medicine Alert* (2%), was also mentioned. One-third (33%) of those who responded to this question rated databases "somewhat" or "very useful."

Through GALEN II (the digital library of UCSF), the library provides faculty, staff, and students with free access to several major biomedical/health databases, including MEDLINE, BIOSIS Previews®, PsycINFOSM, Chemical Abstracts®, ISI Current Contents® (CC), International Pharmaceutical Abstracts (IPA), and the Cochrane Database of Systematic Reviews. Free access to other more specialized databases, such as Micromedex-AltDex®, is provided by individual schools or departments. Figure 4 summarizes data on knowledge of and use of databases (note that respondents could indicate more than one). The majority of respondents

(87%) rated MEDLINE as useful, with 75% having used it in the past year, while 11% used BIOSIS Previews and 9% the NCCAM's free CAM Citation Index (renamed in 2001 as CAM on PubMed). Note, however, that knowledge and use of the following important CAM databases was low: the British Library's Allied and Complementary Medicine Database (AMED) (13%), the University of Illinois's NATURAL PROducts ALERT (NAPRALERT) database (12%), and Elsevier's EMBASE (10%). These three resources are not provided free to UCSF researchers but are fee-based and searched through an intermediary. Other databases were cited and considered useful by only a small number of respondents (1%); these were CC, Chemical Abstracts, IPA, Micromedex-AltDex, and PsycINFO. Most significantly, considering its use as a source of evidence-based medicine (EBM) information for CAM, the Cochrane Database of Systematic Reviews was cited by only one individual!

Though 41% said the Web was one resource they found useful for CAM information, only a few individuals were able to name sources of the information they found there. In their write-in answers, several respondents stated that they used search engines such as Google® but did not know or remember the name of the actual Websites where they had found CAM material. Only eleven Websites were named: NCCAM, Ask Dr. Weil, QuackWatch, ConsumerLab.com, Life Extension Foundation, One: The Body, Mind, & Spirit

Figure 4
Knowledge of and use of bibliographic databases (N = 121)



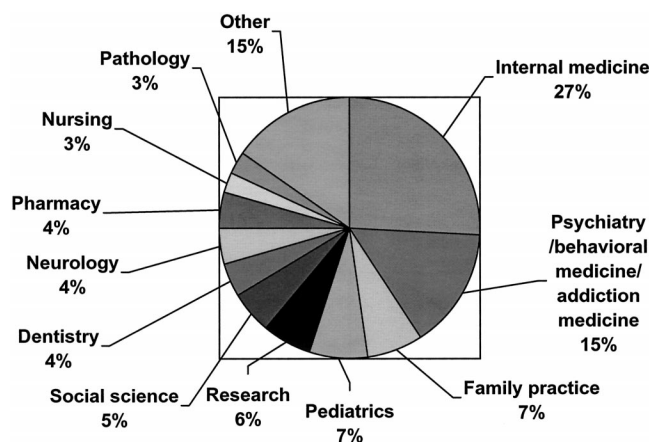
Note on percentage values: respondents can choose more than one database.

Channel, Medscape, Reuters Health (RH), MedWatch (FDA), and RxList: The Internet Drug Directory.[†]

Twelve percent of respondents answered the question "Which additional CAM resources or services

[†] The Website for the National Center for Complementary and Alternative Medicine may be viewed at <http://nccam.nih.gov>, Ask Dr. Weil at <http://www.drweil.com>, QuackWatch at <http://www.quackwatch.com>, ConsumerLab.com at <http://consumerlab.com>, Life Extension Foundation at <http://www.lef.org>, One: The Body, Mind, & Spirit Channel at <http://www.onebodymindspirit.com>, Medscape at <http://www.medscape.com>, Reuters Health at <http://www.reutershealth.com/en/>, MedWatch (FDA) at <http://www.fda.gov/medwatch/>, and RxList: The Internet Drug Directory at <http://www.rxlist.com>.

Figure 5
Specialty (N = 121)



would you like to recommend for the UCSF library?" with only one person actually naming a specific resource: the EMBASE database. The others wrote comments such as "not sure," "Please provide access to more relevant books and journals," and "Please make us more aware of resources already available and how to access or use them." In answering question 14, "Other comments or suggestions," four users made a similar request for help in accessing and using CAM resources.

Seventy-six percent of respondents stated they were interested in learning more about CAM resources. Almost half (45%) expressed a preference for computer-assisted and online instruction. Thirteen percent wished for classroom-based instruction, and 8% wanted in-person consultations. Other learning methods and sources suggested by individuals included written materials distributed by mail or within the library (1%), a Website or electronic mailing list (1%), and symposia (1%).

Figure 5 shows the wide range of medical specialties represented in our survey population. Note that there were no statistically significant correlations between specialty and patterns of CAM information-seeking behavior. Although the following results were not statistically significant (due to small sample size), some interesting trends and observations might merit further investigation:

1. Categories: The single largest group of respondents categorized their work as internal medicine (26%); 15% listed their specialty as psychiatry, psychology, behavioral medicine, or addiction medicine; 7% of respondents were in family medicine and another 7% in pediatrics. The rest of the respondents worked in social

sciences or anthropology, clinical pharmacy, neurology, dentistry, obstetrics/gynecology, pathology, nursing, research, or another area.

2. Internal medicine (31 individuals, 26% of all respondents): Eighty-five percent reported that herbal medicine was applicable to their work, and more than two-thirds said that diet regimens, relaxation exercises, acupuncture, or a combination of these was relevant. Eighty-nine percent were familiar with MEDLINE, and 81% had used it in the past year.

3. Psychiatry, psychology, behavioral medicine, or addiction medicine (17 individuals, 15% of all respondents): The majority of these respondents reported that relaxation exercises (82%), guided imagery (65%), and acupuncture (59%) were applicable to their work. Just over half (53%) said that meditation and prayer, herbal medicine, or a combination was relevant. Like the internal medicine specialists, those behavioral specialists reported that colleagues (59%) and the Web (41%) were useful sources of CAM information. But about 47% also said that journals and the news media provided useful information.

4. Family practice (8 individuals, 7% of all respondents): All reported that herbal medicine was applicable, 88% said relaxation was applicable, and 75% said dietary regimens, movement therapies, or a combination was relevant.

5. Pediatrics (8 individuals, 7% of all respondents): Eighty-eight percent reported that herbal medicine was applicable. Few other CAM areas were considered relevant. None reported spiritual healing as applicable.

6. Research (7 individuals, 6.1% of all respondents): Only one respondent reported that any of the CAM areas were applicable.

7. Social sciences (6 individuals, 5.3% of all respondents): All reported that spiritual healing was applicable, and 83% said that herbal medicine and diet were relevant to their work.

8. Dentistry (5 individuals, 4.4% of all respondents): All reported that acupuncture was applicable. None said that homeopathy, vitamin therapy, or spiritual healing was applicable.

9. Neurology (5 individuals, 4.4% of all respondents): Eighty percent reported that biofeedback was relevant. None said that homeopathy or vitamin therapy was applicable.

10. Clinical pharmacy (5 individuals, 4.4% of all respondents): All reported that herbal medicine was applicable. None said that chiropractics, guided imagery, massage, meditation and prayer, movement therapies, relaxation exercises, or spiritual healing was applicable.

11. Obstetrics/gynecology (4 individuals, 3.5% of all respondents): All reported that herbal medicine, relaxation exercises, and meditation and prayer were applicable. At least half of respondents felt that most of the CAM areas were relevant.

12. Nursing (3 individuals, 2.6% of all respondents): All reported that acupuncture was applicable to their work. One respondent said that all areas were relevant.

13. Pathology (3 individuals, 2.6% of all respondents):

Only one of the three reported that some of the CAM areas were applicable. The other respondents said that none were relevant.

DISCUSSION

The purpose of this study was to investigate the information-seeking behavior of health professionals at UCSF seeking CAM information. Most importantly, our results showed that they frequently did not find the information they sought. Furthermore, the majority of our survey respondents were unfamiliar with several important CAM resources.

There have been several studies of the information-seeking behavior of physicians, or clinicians, investigating the resources they use and the way they find and use information [16]. Though our study population of health sciences faculty was heterogeneous, encompassing individuals from all UCSF schools, clinics, and departments, 65% of our respondents stated they sought information for use in clinical applications, with around 85% identifying a specific medical specialty. Because the majority of our respondents sought information to use in clinical practice, we therefore think it is useful and valid to compare our results for seekers of CAM information with other investigations that have specifically examined the information-seeking behavior of physicians seeking more mainstream medical or health information. In making such a comparison, we can make some interesting observations and see some possible trends among those seeking CAM information.

Studies of the use of information resources by physicians' and other related groups of information seekers indicate that clinicians choose the information source that is most readily available, easily accessible, and easy to use [17]. At UCSF, MEDLINE is readily accessible from computer networks throughout the main campus and its affiliated sites, and we know from our usage statistics that it has always been the most heavily used database on campus. It was therefore not unexpected to find that MEDLINE was the resource most frequently used by the majority of respondents seeking CAM information: 87% were aware of the database, and 75% had used it during the past year. However, there was a huge gap between the number of respondents using MEDLINE (75%) and those using BIOSIS (11%), the next most useful database. We were also surprised to learn that more than 85% were not aware of or had not used important CAM databases such as the British Library's AMED and NCCAM's CAM on PubMed.

Several studies of physician preferences for information resources have identified textbooks as one of the most important sources of information for patient care, and they are often a first choice for those seeking answers to clinical questions [18]. Significantly, only a small number of our respondents (25%) answered the question "Within the last year, which textbook(s) have proved most useful for CAM information," while, for their write-in answer, 5% wrote "not applicable," "do

Table 2
Books used to find complementary and alternative medicine (CAM) information

Title	Authors or editors	Ranking
<i>Rational Phytotherapy: A Physicians' Guide to Herbal Medicine</i>	Schulz, Hansel, Tyler	6*
<i>PDR for Herbal Medicines</i>	Medical Economics Data	3
<i>Handbook of Women's Herbs</i>	Guzman	3
<i>The Honest Herbal Therapeutic Guide to Herbal Medicines</i>	Tyler	2
<i>Complete Commission E German Monographs</i>	Blumenthal, ed.	2
<i>The Holistic Pediatrician</i>	Kemper	2
<i>Stress, Immune Function, and Health: The Connection</i>	Rabkin	1
<i>Primary Care</i>	Singleton, ed.	1
<i>Complementary/Alternative Medicine: An Evidence-Based Approach</i>	Spencer, Jacobs, eds.	1
<i>Textbook of Natural Medicine</i>	Pizzorno, Murray, eds.	1

* Ranked by number of times cited by respondents.

not use," or "none." This result is not surprising, given the current paucity of texts generally held to be authoritative sources of CAM information. The absence of an established core group of resources is reflected in the 2001 Brandon/Hill selected list of print books that contains only seven books for the whole area of CAM [19]. Table 2 lists those texts that were named as useful by respondents. Almost all these titles are in the area of herbal medicine, with two, the *PDR for Herbal Medicine* and the *Commission E Monographs*, actually appearing on the Brandon/Hill list.

Only 41% of our respondents rated the journal literature as "useful" or "very useful." Specific journals they had consulted during the past year ranged from the more mainstream biomedical journals such as *JAMA* and *New England Journal of Medicine* to more specialized ones such as *Phytomedicine* and *Journal of Transpersonal Psychology*. Note, however, that even *JAMA*, the journal most frequently named, was cited by only 12% of respondents. Although studies of physicians and clinicians seeking more mainstream medical information have shown that, along with books, journals are often the primary source used for clinical information [20], the major mainstream medical journals available in the United States are still regarded as being poor sources of CAM information [21]. NCCAM and NLM estimate that worldwide 695 journals are relevant to CAM, but MEDLINE indexes only sixty-nine [22]. Significantly, a study by Fontanarosa indicated that although the number of CAM citations in MEDLINE was steadily increasing, many of these citations were simply letters to the editor or editorials, and there were still few published randomized controlled trials relevant to the clinician [23].

Forty-six percent of our respondents considered their colleagues to be "somewhat" or "very useful" sources of CAM information. So for those seeking CAM information, personal communication seems to be of greater importance than textbooks or journals (Figure 3). Note also that a few of our respondents (2%) reported that patients, friends and family, news media, and newsletters were useful sources of information. Weinberg et al. have noted the importance of physicians seeking advice from colleagues [24], but this information-seeking behavior might be more important in CAM, where information is difficult to find

in print and online resources. Librarians were regarded as a useful source of information by only 6% of respondents.

A recent study reported that 90% of physicians accessed the Web in 2000, with 55% using it on a daily basis [25]. Casebeer et al., in a study of physician medical information-seeking behavior and its relevance to continuing education (CE), found that many physicians were now using the Internet to seek information to help in patient care [26]. Forty-one percent of our respondents reported that they used the Web as a source of CAM information, placing it alongside colleagues and journals as an important resource (Figure 3). However, less than 10% were able to name specific Websites they had accessed, relying instead on the use of general search engines such as Google; seven respondents mentioned that they did not even remember the name of the sites where they had found CAM material! Given the wide variation in the quality of information found on many health-related Websites and the plethora of unverified health information posted there, this finding might be of some concern [27]. As 66% of our respondents expressed an interest in learning more about CAM resources, our results show that there are considerable opportunities for medical librarians to educate users in selecting and evaluating Internet-based CAM information.

Although there was interest in a wide variety of CAM therapies and procedures, the area of greatest interest was herbal medicine (67%). Even if a clinician remains skeptical of the efficacy of herbal remedies, all health care providers are likely to encounter patients who use such preparations. Physicians and pharmacists must therefore become knowledgeable about the adverse effects of herbal remedies and the possibility of deleterious interactions with conventional drugs [28]. The importance of herbal medicine was also reflected in the respondents' choice and knowledge of resources, where the majority of named textbooks (Table 2) were recognized important sources of information about herbs. In addition to several mainstream medical journals that now regularly carry articles on herbs (such as *JAMA* and *BMJ*), several specialized journals named by individuals are also important sources of herbal information: for example, *Alternative Therapies in Health and Medicine*, *HerbalGram*, and *Planta*

Medica. Similarly, in addition to MEDLINE, the bibliographic databases most frequently cited as being relevant were ones known to contain unique information on herbs, such as BIOSIS, NAPRALERT, EMBASE, and AMED. At UCSF, the last three databases are not provided free to the campus community and must be searched for a fee. That they were still cited as "useful" or "very useful" probably attests to the importance of these resources. When performing mediated online searches for UCSF faculty, we have noted the importance of the NAPRALERT database for hard-to-find information on Chinese herbal formulations and EMBASE for unique information on herbal pharmacology.

Because CAM therapies and procedures are beginning to play a more prominent role in U.S. medicine, academic health sciences librarians must become aware of these new developments and modify services accordingly. For example, our survey results show that many health professionals simply do not know where to go to find reliable CAM information, relying too heavily on MEDLINE and Web-based resources. Data from this survey have prompted UCSF librarians to pay greater attention to collection development in CAM, particularly in herbal medicine, highlighting a need to increase the number of quality print and online CAM resources available to the campus. Similarly, new Web pages listing the most reliable CAM Websites have been added to GALEN II.

Data from our survey have been invaluable in helping us plan new CAM training programs for both health professionals and affiliated staff. Because our results indicated that UCSF-affiliated health professionals were interested in learning more about CAM resources, we introduced a class on this topic to the library's informatics program. This class has been well attended by both faculty and staff. Similarly, the increased contact between UCSF faculty and librarians arising from this survey has resulted in invitations from the UCSF School of Nursing and OCIM to give CAM presentations to both students and faculty. In 2002, we also cooperated with faculty from OCIM to compile lists of appropriate resources for use in the CAM section of the UCSF School of Medicine's cancer curriculum classes.

Our survey results indicate that many health professionals are not familiar with some of the most important sources of CAM information. Hence, in our role as educators, librarians can play an important role in CAM by teaching health professionals how to find and use the most reliable print and electronic resources.

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APPENDIX

Complementary and alternative medicine (CAM) information needs assessment survey

The Library and Center for Knowledge Management (CKM) at the University of California, San Francisco (UCSF) is developing a new service to help UCSF faculty and personnel locate information resources on complementary and alternative medicine (CAM). Your input and comments will help us gain a better understanding of your information needs. It would be greatly appreciated if you would take a few minutes to complete this survey. If you have any questions or concerns, please contact us at altmed-info@library.ucsf.edu. *Note:* Your responses to this survey will remain confidential.

1. What areas of complementary and alternative medicine (CAM) are applicable to your work? (Choose all that apply.)

- ☐ Acupuncture
- ☐ Biofeedback
- ☐ Chiropractic
- ☐ Diet (Pritikin, Ornish, macrobiotic, etc.)
- ☐ Guided imagery or visualization
- ☐ Herbal medicine
- ☐ Homeopathic medicine
- ☐ Massage therapy or body work
- ☐ Meditation or prayer
- ☐ Megadose vitamin therapy
- ☐ Movement therapies (yoga, tai chi chuan, etc.)
- ☐ Relaxation exercises
- ☐ Spiritual healing
- ☐ Other (Please specify)

2. How do you use the CAM information? (Choose all that apply)

- ☐ Clinical application
- ☐ Grant or contract proposal
- ☐ Preparation of an article, book, speech, etc.
- ☐ Research
- ☐ Teaching
- ☐ Other (Please describe.)

3. Within the last year, how often have you tried to find information on CAM?

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Less than monthly
- ☐ Never

4. The last time you looked for CAM information:

a. Approximately how much time did you spend?

minutes

b. Did you find the information you were looking for?

- ☐ Yes
- ☐ No
- ☐ Partially

5. Please grade the following sources based on their usefulness for CAM information. Please use the following scale: 5 = Very useful; 4 = Somewhat useful; 3 = Hardly useful; 2 = Not useful at all; 1 = Have not used.

- Colleagues
 Databases (Please specify)
 Journals
 Librarians
 News, media, popular press
 Textbooks
 Web resources
 Other (Please describe)

6. Several databases already exist that have information relevant to CAM. Please indicate next to the resources listed below, which of them you are *aware of* or *have used in the past year*.

- | Aware of | Used in the past year |
|----------------------|--|
| <input type="text"/> | <input type="text"/> Allied and Alternative Medicine (AMED) |
| <input type="text"/> | <input type="text"/> BIOSIS |
| <input type="text"/> | <input type="text"/> Complementary and Alternative Medicine (CAM) Citation Index |
| <input type="text"/> | <input type="text"/> EMBASE |
| <input type="text"/> | <input type="text"/> MEDLINE |
| <input type="text"/> | <input type="text"/> NATural PROducts Alert (NAPRALERT) |
| <input type="text"/> | <input type="text"/> Other (Please specify) |

7. Within the last year, which journal(s) have proved most useful for information on CAM?

8. Within the last year, which textbook(s) have proved most useful for information on CAM?

9. Within the last year, which Website(s) have proved most useful for information on CAM?

10. Which additional CAM resources or services would you like to recommend for the UCSF library?

11. Would you be interested in learning more about CAM resources?

- Yes
 No

12. If you answered yes to #11, how would you prefer to learn? (Please rank them in order, with 1 = most preferable.)

- Classroom instruction
 Computer-assisted instruction (online tutorial, email, etc.)
 In-person consultation
 Other (Please specify)

13. What is your specialty?

- Internal medicine
 Family practice
 Obstetrics and gynecology
 Pediatrics
 Other (Please specify)

If you have a subspecialty, please list _____

14. Other comments or suggestions.

Thank you very much for your time. Please mail the completed survey form to Min-Lin E. Fang, Information Services Department, The Library and Center for Knowledge, UCSF, P.O. Box 0840 SF CA 94143-0840.